Sheet Resistivity Measurements on Rectangular Surfaces–General Solution for Four Point Probe Conversion Factors

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Voltage-current ratios, measured using probes on the surface of a homogeneous conducting sheet, are converted to resistance per square by "conversion factors". For rectangles, a closed form solution for these factors is obtained by using the complex Jacobian sine-amplitude function

$$x + iy = \mathrm{sn}\,[(u + iv), k]$$

as a transformation.

After transformation, an insulated edge rectangle becomes a semi-infinite sheet. Two conjugate current point images establish the boundary condition. A double-sided rectangle becomes an infinite sheet directly, needing no images.

New tables have been prepared for a pattern of probe center locations uniformly distributed over the surface. The probe chosen for these tables is a common arrangement having four equally spaced points on a line parallel to the longer edge of the rectangle.

I. INTRODUCTION

Sheet resistivity measurements, made with probes on a bounded surface, are converted to resistance per square by "conversion factors". These factors are a function of the geometry and relative dimensions of the parts. For rectangular slices, tables of such factors[1, 2] are available for the special case of four equally spaced points symmetrically placed on a center line. These tables were computed by use of convergent infinite series, derived for insulated edge and double-sided sheets.

A general closed form solution has been developed for rectangles with arbitrary point locations. The method is applicable to any other

surface shape which, through a conformal transformation, can be converted into a semi-infinite plane. For a rectangle, the transformation is the complex Jacobian sine-amplitude function.

New tables have been computed for four equally-spaced probe points in a line, but with the probe center at points distributed in a uniform pattern over the rectangular surface. With these tables and interpolation, determination of the sheet resistivity now can be made anywhere on the rectangular surface, for either insulated-edge or double-sided conduction. Of course, a new factor can be computed directly for any point not tabulated, rather than calculated by interpolation. (The new tables begin on page 2292.)

The purpose of using the transformation is to change the boundary of the actual slice to the X-axis of a semi-infinite plane, and the points to equivalent locations in this semi-infinite sheet. Only two mirror images are added when the slice has insulated edges; none when double sided. This compares to the double infinity of images needed for the former tables, even with the maximum possible symmetry assumed.

II. METHOD

A sketch of a rectangular slice having dimensions of a and d with four arbitrarily located points is shown in Fig. 1. Without loss of generality, this rectangle can be placed in a coordinate system with the lower edge on the abscissa and the origin at the center of that edge. With this choice and a linear normalization of dimensions to be described later, the (w-plane) rectangle is transformed into a (z-plane) semi-infinite sheet* of the same sheet resistivity by the complex sine-amplitude function,

$$x + iy = \text{sn}\,[(u + iv), k]. \tag{1}$$

After transformation, the rectangle occupies the entire upper semi-infinite plane. The second part of Fig. 1 shows the locations of the four transformed points. The perimeter of the rectangle becomes the entire X-axis.

In order that the desirable logarithmic potential of a current source in an infinite sheet[1] shall apply, it is necessary to complete the lower half of the infinite plane with an attached conducting sheet of the same sheet resistivity.

* Ref. 3, page 57, Example 3.

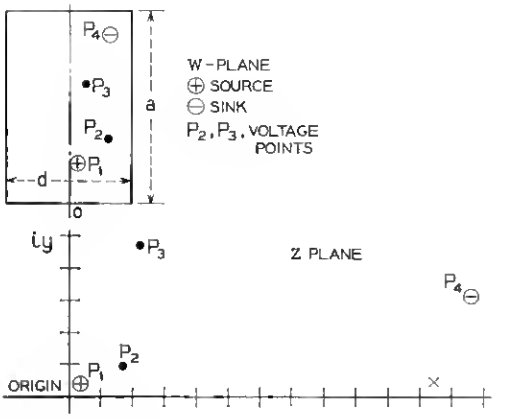

Fig. 1 — Complex sine-amplitude transformation of a rectangle.

2.1 *Case 1: Insulated Edges*

The first case described will be that of a transformed insulated edge rectangle. The needed lower sheet may be connected, provided that mirror current images for each real source or sink are included to maintain the boundary condition. Fig. 2 shows the complete point array. An outline for the computations to determine the conversion factor will be given later.

2.2 *Case 2: Double-Sided Conduction*

The second case will be that of a double-sided or folded sheet. An extra operation to the rectangle is performed before applying the same transformation as used above. First cut three edges of the double-sided rectangle, unfold and arrange in the coordinate system shown in Fig. 3. This places the upper surface exactly as the insulated edge sheet had been placed in Fig. 1, but the unfolded connected under surface extends the new single sheet into the like area below the abscissa. Now when the sine-amplitude transformation is applied to this entire surface, the rectangle in the upper half of the w-plane fills completely the upper semi-infinite z-plane, as for the single-sided sheet, and the lower rectangle now fills the lower semi-infinite plane. At the same time, this reconnects the two surfaces along the X-axis, eliminating the temporary effect of the cut. The four points again have been transformed exactly as in the lower half of Fig. 1. However, as there now is no boundary condition to fulfill, no images are necessary.

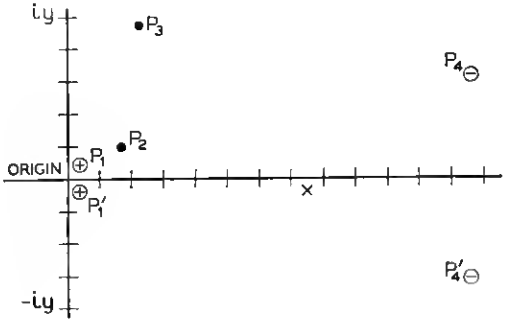

Fig. 2 — Mirror images added with lower sheet to maintain insulated boundary condition.

Thus, the formula will be even simpler than for the insulated edge case.

It is clear that this method can be applied to any surface which can be transformed into a semi-infinite plane. For example, in Ref. 2, this was done with a circle as a step in the proof that a double-sided circular slice behaved exactly as if it were an infinite sheet. This simple result does not apply to a double-sided rectangle because of the singularities of the sn-function.

III. LOGARITHMIC POTENTIAL

As mentioned earlier, the method used for derivation of the conversion factors is based on use of a conformal transformation leading

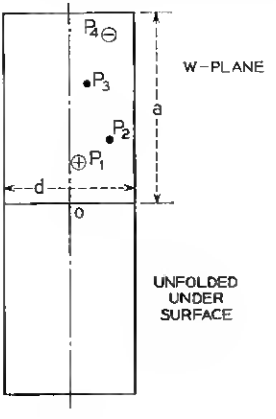

Fig. 3 — Cut and unfolded double sided conduction sheet.

to an infinite sheet. In an infinite sheet, a current source gives rise to the simple logarithmic potential

$$\varphi - \varphi_0 = -\frac{I\rho_s}{2\pi} \ln r, \tag{2}$$

where φ is the potential, I the current, ρ_s the sheet resistivity, and r the distance from the current source. For a sink, the sign is reversed. A sketch of a surface with a current source P_1 is drawn in Fig. 4. Two points, P_2 and P_3, have been shown, representing the "voltage points" of a four-point probe. A resistivity measuring set determines their voltage difference. The voltage difference is

$$\varphi_2 - \varphi_3 = V = \frac{I\rho_s}{2\pi} \ln \frac{r_{13}}{r_{12}}. \tag{3}$$

There is a similar expression for each current source or sink. The simple addition, one for each current source or sink is the solution when summing the effects of any number of points. This is because superposition applies.

IV. CONVERSION FACTOR

The potential difference between the two voltage points (P_2 and P_3) due to all real and image current source points is:

$$V_+ = \frac{I\rho_s}{2\pi} \left(\ln \frac{r_{13}}{r_{12}} + \ln \frac{r'_{13}}{r'_{12}} + \cdots \right), \tag{4}$$

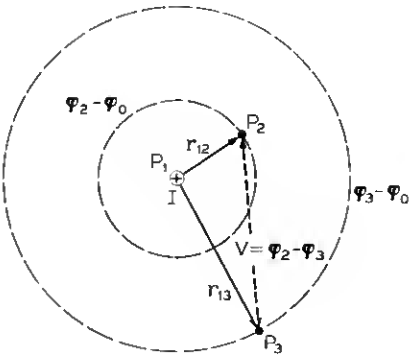

Fig. 4 — Logarithmic potential difference.

where each radius marked by a prime is the distance from an image point to a voltage point.

Likewise for all sinks:

$$V_{-} = \frac{I\rho_s}{2\pi}\left(\ln\frac{r_{24}}{r_{34}} + \ln\frac{r'_{24}}{r'_{34}} + \cdots\right). \tag{5}$$

4.1 *Case 1: Insulated Edges*

For a rectangle with insulated edges, there are two real current points 1, 4 and two mirror image current points 1′, 4′. Adding the two equations above:

$$V = \frac{I\rho_s}{2\pi}\ln\left[\left(\frac{r_{13}}{r_{12}}\right)\left(\frac{r'_{13}}{r'_{12}}\right)\left(\frac{r_{24}}{r_{34}}\right)\left(\frac{r'_{24}}{r'_{34}}\right)\right]. \tag{6}$$

Rearranging

$$\rho_s = \left(\frac{V}{I}\right) \times \text{C.F.}, \tag{7}$$

where

$$\text{C.F.} = \frac{2\pi}{\ln\left[\left(\frac{r_{13}}{r_{12}}\right)\left(\frac{r'_{13}}{r'_{12}}\right)\left(\frac{r_{24}}{r_{34}}\right)\left(\frac{r'_{24}}{r'_{34}}\right)\right]}. \tag{8}$$

4.2 *Case 2. Double-Sided Sheet*

For a double-sided sheet, there are no images. Clearly the conversion factor can be written directly from (8) above simply by omission of the prime terms:

$$\text{C.F.} = \frac{2\pi}{\ln\left[\left(\frac{r_{13}}{r_{12}}\right)\left(\frac{r_{24}}{r_{34}}\right)\right]} \tag{9}$$

V. JACOBIAN ELLIPTIC FUNCTION, sn w

A description for each of the steps needed for a determination of a conversion factor for a rectangular surface, with arbitrary point locations, has been given. Involved is the use of the complex sine-amplitude function, sn w. The next two sections with Appendices A, B, and C, will briefly present all needed material for determination of this function.

The more general but possibly more familiar Schwarz-Christoffel transformation relates a semi-infinite plane and any polygon. The relation is an integral expression between points in the w and z planes. Equation (10) is the form for a rectangle[3] shown in Fig. 1. In this form

it may be considered as one of a transform pair, whose inverse is the equivalent sine-amplitude function, sn w. The pair

$$w = \int_0^z \frac{dz}{\sqrt{(1 - z^2)(1 - k^2z^2)}} \tag{10}$$

$$z = \text{sn}\,(w, k). \tag{11}$$

The Schwarz-Christoffel transformation is a directly written expression which serves to identify the sine-amplitude function (11) as a solution for the present problem.

Equation (11) is more convenient for computations to determine where a transformed point from a rectangle in the w-plane appears in the z-plane. This is the complex sine-amplitude function, which is related to elliptic functions. Ref. 7 has charts of this function.

Tables are in Ref. 8. However, these are double entry tables since the value of an elliptic function depends not only on the argument, but also on the modulus k. Interpolation between tabulated values is laborious and subject to error. Fortunately, the functions are representated by rapidly converging series.

VI. ELLIPTIC FUNCTION PARAMETERS

There are five elliptic function parameters k, k', K, K', K'/K and two auxiliary nomes q and q_1[9], only one of which is independent. For the coordinate choice of Fig. 5, the relation which can be identified through similarity of the rectangles is

$$\frac{K'}{K} \equiv 2\left(\frac{a}{d}\right). \tag{12}$$

Starting with this, Appendix A defines the nomes and compiles a list of rapidly converging series for the other parameters.

Appendix B tabulates the real sn, cn, and dn functions, using the very rapidly converging Theta series.[5] Finally, Appendix C defines the complex sine-amplitude function (11), (38) in terms of the real functions of Appendix B.[6]

VII. COMPUTATION—GENERAL CASE

A summary of the steps for the general case of arbitrary point locations follows:

Step 1: Determine the elliptic function parameters using (20) through (26) starting with the side length ratio a/d of the rectangle.

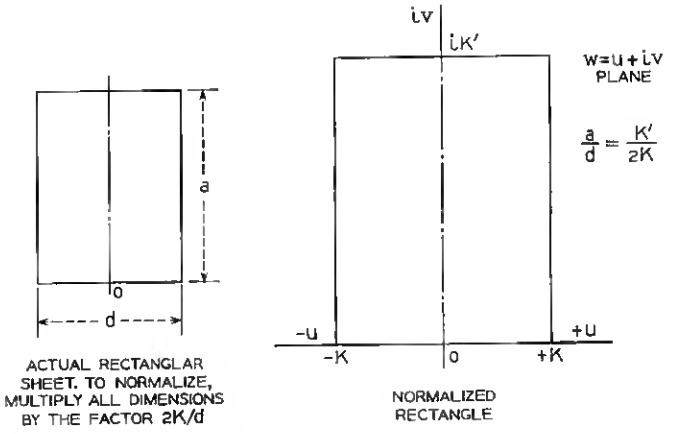

Fig. 5 — The initial linear transformation.

Step 2: Transform the points in the rectangle to their place in a normalized rectangle, such as Fig. 5, by linear multiplication of all dimensions with $(2K/d)$.

Step 3: Compute the real elliptic functions of (31) through (36) for each probe point.

Step 4: Transform each of the normalized probe point locations with the complex sine-amplitude function, (38). When the rectangle has insulated edges, add complex conjugate mirror image current points, as in Fig. 2.

Step 5: Determine the distances from each current point to the voltage points.

Step 6: Substitute in (8) when edges are insulated, or (9) when the slice is two-sided for the conversion factor.

VIII. COMPUTATION—FOUR EQUALLY SPACED PROBE POINTS

New tables have been computed for a commonly used four-point in-line probe, having equal point spacings. Fig. 6 shows the probe on the rectangle. The dimensions necessary to determine a particular conversion factor, are defined in the figure as a, b, c, d, s, and t. The letters a and d represent the sides of the rectangle, and s the point spacing. The slice thickness t is needed for double-sided conduction. With double-sided conduction $(d + t)$ and $(a + t)$ are used for d and a, respectively. There are two new dimensions, b and c. These relate the center of the probe to the center of the rectangle.

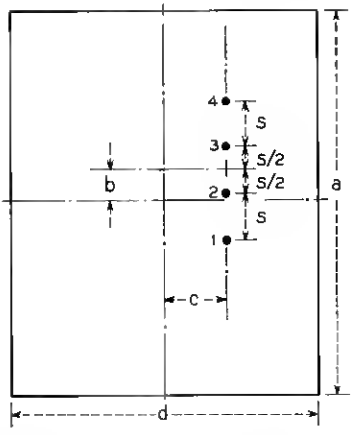

Fig. 6 — General arrangement for the four point probe on a rectangular sheet.

A FORTRAN computer program has been written by S. G. Student, Jr. The computer program and the tables use a dimensionless notation, involving only ratios of these lengths. The notation is shown in Fig. 7 where thirty probe point centers chosen for the tables have been plotted. The number of the center of the probe point location is the

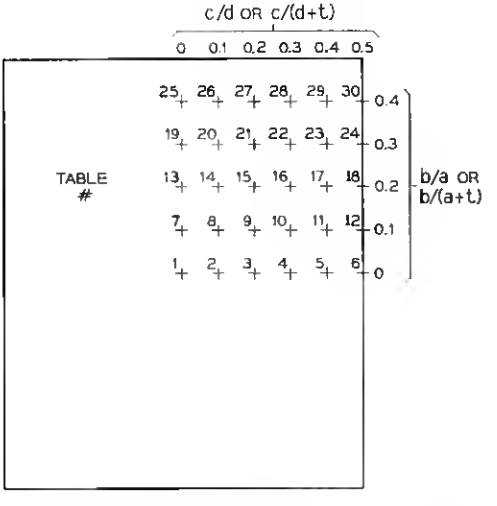

Fig. 7 — Plot of the 30 locations selected for the probe center—dimensionless notation.

same as that of the corresponding table. Hence this figure also serves as an index for the tables.

The probe center locations have been located at the intersections of $b/a = 0, 0.1, 0.2, 0.3$, and 0.4 with $c/d = 0, 0.1, 0.2, 0.3, 0.4$, and 0.5. There is a restriction for relative point spacing d/s to keep the four points on the sheet. An expression for this restriction is

$$\frac{a}{2} \geqq b + \frac{3s}{2}$$

which may be rearranged to be

$$\left(\frac{d}{s}\right) \geqq \frac{3}{(a/d)[1 - 2(b/a)]} \tag{13}$$

The tables are for probe center points shown only in one quarter. Because of symmetry, these tables apply to all quarters. That is, b can be either above or below the horizontal center line and c can be either right or left of the vertical center line.

The four-point locations before normalization are

$$\begin{aligned} P_1 &= c + i\left(\frac{a}{2} + b - \frac{3s}{2}\right) \\ P_2 &= c + i\left(\frac{a}{2} + b - \frac{s}{2}\right) \\ P_3 &= c + i\left(\frac{a}{2} + b + \frac{s}{2}\right) \\ P_4 &= c + i\left(\frac{a}{2} + b + \frac{3s}{2}\right). \end{aligned} \tag{14}$$

For a given a/d, the elliptic parameters are computed for Step 1. The rectangular coordinates of the above four points are normalized by multiplication by $(2K/d)$. The four normalized points then are

$$\left.\begin{aligned} u_1 + iv_1 \\ u_2 + iv_2 \\ u_3 + iv_3 \\ u_4 + iv_4 \end{aligned}\right\} \quad \begin{aligned} &0 \leqq u \leqq K \\ &\\ &0 \leqq v \leqq K'. \end{aligned} \tag{15}$$

This completes Step 2. For Step 3, compute the real elliptic functions, and with Step 4, determine the four real point locations in the semi-

infinite upper half plane.

$$\begin{aligned} x_1 + iy_1 &= \text{sn}\,([u_1 + iv_1], k) \\ x_2 + iy_2 &= \text{sn}\,([u_2 + iv_2], k) \\ x_3 + iy_3 &= \text{sn}\,([u_3 + iv_3], k) \\ x_4 + iy_4 &= \text{sn}\,([u_4 + iv_4], k). \end{aligned} \tag{16}$$

The mirror images are the conjugates of the first and last lines:

$$\begin{aligned} x_1 - iy_1 \\ x_4 - iy_4 \,. \end{aligned} \tag{17}$$

Then for Step 5 the distance equations are

$$\begin{aligned} r_{12} &= (|\, x_2 - x_1 \,|^2 + |\, y_2 - y_1 \,|^2)^{\frac{1}{2}} \\ r_{13} &= (|\, x_3 - x_1 \,|^2 + |\, y_3 - y_1 \,|^2)^{\frac{1}{2}} \\ r_{24} &= (|\, x_4 - x_2 \,|^2 + |\, y_4 - y_2 \,|^2)^{\frac{1}{2}} \\ r_{34} &= (|\, x_4 - x_3 \,|^2 + |\, y_4 - y_3 \,|^2)^{\frac{1}{2}}. \end{aligned} \tag{18}$$

If the sheet is insulated then the image distances are

$$\begin{aligned} r'_{12} &= (|\, x_2 - x_1 \,|^2 + |\, y_2 + y_1 \,|^2)^{\frac{1}{2}} \\ r'_{13} &= (|\, x_3 - x_1 \,|^2 + |\, y_3 + y_1 \,|^2)^{\frac{1}{2}} \\ r'_{24} &= (|\, x_4 - x_2 \,|^2 + |\, y_4 + y_2 \,|^2)^{\frac{1}{2}} \\ r'_{34} &= (|\, x_4 - x_3 \,|^2 + |\, y_4 + y_3 \,|^2)^{\frac{1}{2}}. \end{aligned} \tag{19}$$

Finally, for Step 6, substitute these values in (8) and (9) for the conversion factors.

IX. EDGE EFFECT

The solution for two-sided conduction does not include two effects which actually are present. First, the equivalent flattened surface defined by using $(d+t)$ and $(a+t)$ for the outside dimensions includes, at the four corners, small square pieces of size t by t, which actually are not present. Second, under every edge there is a region of increased conductivity because the diffused impurity entered through two surfaces. This extra diffusion causes the equivalent skin thickness both to be increased and to be lower in bulk resistivity under the edge.

Thus, there exists "frames" of lower resistivity surrounding the surface being tested. It is believed the coefficients may be in error and too low when points are close to an edge of a two-sided slice. This effect has neither been evaluated nor included in the tables.

X. VERIFICATION

As described above, Table I has previously been determined from infinite series obtained by use of image arrays.* There are some discrepancies in the fourth and fifth significant figures. A few of the earlier factors have been recalculated using the series method. For each case the error was in the prior table.

From Tables I, VII, XIII, XIX, and XXV, some limiting double sided cases may be determined by appropriate changes of the dimensionless parameters. For instance, consider an insulated edge surface with the points on the vertical bisector. Now fold the sheet on this line, placing the right side say, underneath. Note that because of the original symmetry, at every point where the edges now come together, the potentials before connection were identical. Therefore, when connected to form a two-sided sheet, no change in current occurs, and the V/I ratio at the four points is unaltered. Thus, the double-sided sheet with the points on one edge made by folding, has the same numerical conversion factors as the original single sheet with the points in the center when the appropriate (a/d) and (d/s) parameters are identified.

Two examples:	b/a	c/d	d/s	a/d	C.F.
Single Sheet	0	0	3	1	2.4562
Double-Sided Sheet	0	0.5	1.5	2	2.4562
Single Sheet	0	0	3	2	2.7000
Double-Sided Sheet	0	0.5	1.5	4	2.7000

The same type of identification can be made for other values of b/a.

Some limiting insulated edge checks also can be made from Tables I, VII, XIII, XIX, and XXV, through appropriate changes to the dimensionless parameters but this time halving the conversion factor. These new sheets are made by cutting the original sheet along the vertical bisector. Because of vertical symmetry, no current crossed this line before the cut and therefore the field pattern is unaffected after the cut. As before (a/d) and (d/s) are doubled and halved, respectively. However, now all the current flows in half the area. This

* The tables begin on page 2292.

causes all potential differences to be doubled. As the sheet resistivity has not been affected, the conversion factor therefore is just half.

Two examples:	b/a	c/d	d/s	a/d	C.F.
Single Sheet	0	0	5	1	3.5098 ÷ 2
Single Sheet	0	0.5	2.5	2	= 1.7549
Single Sheet	0.2	0	3	2	2.6647 ÷ 2
Single Sheet	0.2	0.5	1.5	4	= 1.3323

For an intermediate probe center location, a chart of the complex sine-amplitude function for $(a/d) = 1.2173$, included with Ref. 7, can be read to about three-figure accuracy. Several conversion factors not given in these tables were verified this way.

Finally, when the two current points are on the top and bottom edges of a slice, the double-sided conversion factor is twice that for the insulated edge sheet. This is because exactly half the current flows across the back when double sided.

APPENDIX A

Elliptical Function Parameters

The elliptic function parameters are related to the rectangle through the identity

$$\frac{K'}{K} \equiv 2\left(\frac{a}{d}\right). \tag{20}$$

This relation uniquely determines the other elliptic function coefficients. It is convenient to define the nomes:

$$q = \exp\left(-\pi \frac{K'}{K}\right) \tag{21}$$

$$q_1 = \exp\left(-\pi \frac{K}{K'}\right). \tag{22}$$

Then the modulus:

$$k = 4\sqrt{q}\left[\frac{1 + q^2 + q^6 + q^{12} + \cdots q^{n(n+1)} + \cdots}{1 + 2(q + q^4 + q^9 + \cdots q^{n^2} + \cdots)}\right]^2. \tag{23}$$

The complementary modulus:

$$k' = \sqrt{1 - k^2} = \left[\frac{1 - 2q + 2q^4 - 2q^9 + \cdots 2(-1)^n q^{n^2} + \cdots}{1 + 2(q + q^4 + \cdots q^{n^2} + \cdots)}\right]^2. \tag{24}$$

The complete elliptic integral:

$$K = \int_0^1 \frac{dt}{\sqrt{(1 - t^2)(1 - k^2t^2)}} = \frac{\pi}{2}[1 + 2q + 2q^4 + 2q^9 + \cdots 2q^{n^2} + \cdots]^2. \tag{25}$$

The complementary complete elliptic integral is

$$K' = \int_0^1 \frac{dt}{\sqrt{(1 - t^2)(1 - k'^2t^2)}} = \frac{\pi}{2}[1 + 2q_1 + 2q_1^4 + \cdots 2q_1^{n^2} + \cdots]^2 = -\frac{\pi K}{\ln q_1} = 2K\left(\frac{a}{d}\right) \tag{26}$$

so that K' is the same function of the complementary modulus k' as K is of k.

APPENDIX B

Real Elliptic Functions

The elliptic functions can be expressed in terms of certain auxiliary functions called the Theta functions (Ref. 5, p. 471). The following definitions and notations are chosen:

$$\theta_0(u/2K, q) = 1 + 2\sum_{n=1}^{\infty}(-1)^n q^{n^2}\cos 2n\frac{\pi u}{2K} \tag{27}$$

$$\theta_1(u/2K, q) = 2q^{\frac{1}{4}}\sum_{n=0}^{\infty}(-1)^n q^{n(n+1)}\sin(2n + 1)\frac{\pi u}{2K} \tag{28}$$

$$\theta_2(u/2K, q) = 2q^{\frac{1}{4}}\sum_{n=0}^{\infty} q^{n(n+1)}\cos(2n + 1)\frac{\pi u}{2K} \tag{29}$$

$$\theta_3(u/2K, q) = 1 + 2\sum_{n=1}^{\infty} q^{n^2}\cos 2n\frac{\pi u}{2K}. \tag{30}$$

Then

$$\operatorname{sn}(u, k) = \frac{1}{\sqrt{k}}\frac{\theta_1(u/2K, q)}{\theta_0(u/2K, q)} \tag{31}$$

$$\operatorname{cn}(u, k) = \sqrt{\frac{k'}{k}}\,\frac{\theta_2(u/2K, q)}{\theta_0(u/2K, q)} = \sqrt{1 - \operatorname{sn}^2(u, k)} \tag{32}$$

$$\operatorname{dn}(u, k) = \sqrt{k'}\,\frac{\theta_3(u/2K, q)}{\theta_0(u/2K, q)} = \sqrt{1 - k^2 \operatorname{sn}^2(u, k)}. \tag{33}$$

For a complex variable a second set for v will be needed, obtained by permuting the values of q and q_1, k and k', and K and K', in (27) through (30).

$$\operatorname{sn}(v, k') = \frac{1}{\sqrt{k'}}\,\frac{\theta_1(v/2K', q_1)}{\theta_0(v/2K', q_1)} \tag{34}$$

$$\operatorname{cn}(v, k') = \sqrt{\frac{k}{k'}}\,\frac{\theta_2(v/2K', q_1)}{\theta_0(v/2K', q_1)} = \sqrt{1 - \operatorname{sn}^2(v, k')} \tag{35}$$

$$\operatorname{dn}(v, k') = \sqrt{k}\,\frac{\theta_3(v/2K', q_1)}{\theta_0(v/2K', q_1)} = \sqrt{1 - (k' \operatorname{sn}(v, k'))^2}. \tag{36}$$

APPENDIX C

Complex Sine-Amplitude Elliptic Functions

For brevity we put[6]

$$\begin{aligned} s &= \operatorname{sn}(u, k) & s_1 &= \operatorname{sn}(v, k') \\ c &= \operatorname{cn}(u, k) & c_1 &= \operatorname{cn}(v, k') \\ d &= \operatorname{dn}(u, k) & d_1 &= \operatorname{dn}(v, k'). \end{aligned} \tag{37}$$

Note that the complementary modulus k', etc., go with the suffix 1. Then

$$\begin{aligned} x + iy &= \operatorname{sn}[(u + iv), k] \\ &= \frac{s\,d_1 + ic\,ds_1\,c_1}{c_1^2 + k^2 s^2 s_1^2}. \end{aligned} \tag{38}$$

A substitution, to avoid a negative sign in the denominator, has been made in (38) from page 20 of Ref. 8.

(References are listed on page 2322.)

TABLE I—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.$ $b/a = 0$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					0.9994
1.25					1.2468
1.50				1.4787	1.4893
1.75				1.7197	1.7239
2.00			1.8978	1 9454	1.9475
2.50		2.2244	2.3342	2 3532	2.3541
3.00	2.4562	2.6298	2.6897	2.7000	2.7005
4.00	3.1134	3.1927	3.2197	3.2244	3.2246
5.00	3.5098	3.5563	3.5721	3 5749	3.5750
7.50	4.0089	4.0282	4.0347	4.0358	4.0358
10.00	4.2208	4.2314	4.2350	4.2356	4.2356
15.00	4.3878	4.3925	4.3940	4.3943	4.3943
20.00	4.4498	4.4534	4.4533	4.4534	4.4534
40.00	4.5114	4.5120	4.5123	4.5123	4.5123
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d + t) = 0.$ $b/(a + t) = 0$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					1.9497
1.25					2.3549
1.50				2.9575	2.7010
1.75				3.1508	2.9887
2.00			3.7956	3.3381	3.2248
2.50		4.4488	3.8987	3.6409	3.5751
3.00	4.9123	4.3701	4.0231	3.8545	3.8109
4.00	4.6477	4.3823	4.2023	4.1123	4.0888
5.00	4.5791	4.4183	4.3068	4.2505	4.2357
7.50	4.5415	4.4735	4.4254	4.4008	4.3943
10.00	4.5353	4.4976	4.4708	4.4571	4.4534
15.00	4.5329	4.5164	4.5045	4.4985	4.4969
20.00	4.5325	4.5233	4.5166	4.5132	4.5123
40.00	4.5324	4.5301	4.5284	4.5276	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE II—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.100$ $b/a = 0$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					0.9970
1.25					1.2407
1.50				1.4566	1.4779
1.75				1.6935	1.7062
2.00			1.8529	1.9143	1.9233
2.50		2.1637	3.2801	2.3124	2.3182
3.00	2.3911	2.5601	2.6306	2.6525	2.6568
4.00	3.0388	3.1222	3.1600	3.1732	3 1761
5.00	3.4414	3.4938	3.5186	3.5278	3.5298
7.50	3.9638	3.9876	3.9995	4.0041	4.0051
10.00	4.1913	4.2050	4.2119	4.2146	4.2153
15.00	4.3731	4.3793	4.3825	4.3838	4.3841
20.00	4.4411	4.4447	4.4465	4.4472	4.4474
40.00	4.5091	4.5100	4.5105	4.5107	4.5107
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.100$ $b/(a+t) = 0$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					1.9493
1.25					2.3548
1.50				2.9132	2.7009
1.75				3.1216	2.9887
2.00			3.7058	3.3173	3.2247
2.50		4.3275	3.8442	3.6286	3.5751
3.00	4.7822	4.2873	3.9864	3.8463	3.8109
4.00	4.5750	4.3364	4.1823	4.1079	4.0888
5.00	4.5327	4.3891	4.2942	4.2477	4.2357
7.50	4.5209	4.4606	4.4198	4.3996	4.3943
10.00	4.5237	4.4903	4.4677	4.4564	4.4534
15.00	4.5278	4.5132	4.5032	4.4982	4.4969
20.00	4.5296	4.5215	4.5158	4.5130	4.5123
40.00	4.5316	5.5296	4.5282	4.5275	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE III—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.200$ $\quad b/a = 0$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					0.9905
1.25					1.2243
1.50				1.3971	1.4466
1.75				1.6229	1.6565
2.00			1.7297	1.8285	1.8539
2.50		1.9913	2.1294	2.1947	2.2119
3.00	2.1964	2.3604	2.4601	2.5096	2.5227
4.00	2.8111	2.9100	2.9757	3.0090	3.0179
5.00	3.2254	3.2962	3.3444	3.3689	3.3754
7.50	3.8117	3.8496	3.8758	3.8891	3.8926
10.00	4.0882	4.1116	4.1277	4.1359	4.1381
15.00	4.3202	4.3314	4.3392	4.3431	4.3441
20.00	4.4098	4.4163	4.4208	4.4231	4.4237
40.00	4.5009	4.5026	4.5037	4.5043	4.5045
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.200$ $\quad b/(a+t) = 0$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					1.9482
1.25					2.3544
1.50				2.7943	2.7007
1.75				3.0440	2.9885
2.00			3.4595	3.2622	3.2246
2.50		3.9827	3.6963	3.5963	3.5750
3.00	4.3928	4.0532	3.8872	3.8248	3.8109
4.00	4.3589	4.2077	4.1282	4.0962	4.0888
5.00	4.3951	4.3075	4.2600	4.2403	4.2356
7.50	4.4601	4.4247	4.4048	4.3964	4.3943
10.00	4.4895	4.4702	4.4593	4.4546	4.4534
15.00	4.5126	4.5042	4.4994	4.4974	4.4969
20.00	4.5211	4.5164	4.5138	4.5126	4.5123
40.00	4.5295	4.5284	4.5277	4.5274	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE IV—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.300$ $b/a = 0$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					0.9823
1.25					1.2027
1.50				1.3201	1.4040
1.75				1.5299	1.5868
2.00			1.5640	1.7110	1.7534
2.50		1.7446	1.9197	2.0193	2.0470
3.00	1.8930	2.0691	2.2046	2.2797	2.3002
4.00	2.4394	2.5629	2.6564	2.7067	2.7203
5.00	2.8395	2.9345	3.0053	3.0428	3.0528
7.50	3.4871	3.5438	3.5852	3.6067	3.6124
10.00	3.8453	3.8825	3.9094	3.9233	3.9270
15.00	4.1837	4.2027	4.2163	4.2234	4.2252
20.00	4.3258	4.3371	4.3452	4.3494	4.3505
40.00	4.4779	4.4809	4.4830	4.4841	4.4844
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.300$ $b/(a+t) = 0$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					1.9469
1.25					2.3538
1.50				2.6402	2.7004
1.75				2.9453	2 9883
2.00			3.1281	3.1929	3.2245
2.50		3.4892	3.5019	3.5558	3.5749
3.00	3.7860	3.7237	3.7579	3.7979	3.8108
4.00	4.0283	4.0290	4.0583	4.0817	4.0887
5.00	4.1864	4.1949	4.2160	4.2312	4.2356
7.50	4.3685	4.3753	4.3855	4.3924	4.3943
10.00	4.4382	4.4426	4.4485	4.4523	4.4534
15.00	4.4899	4.4920	4.4946	4.4964	4.4969
20.00	4.5083	4.5096	4.5111	4.5120	4.5123
40.00	4.5263	4.5266	4.5270	4.5273	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE V—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.400 \qquad b/a = 0$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					0.9754
1.25					1.1841
1.50				1.2542	1.3657
1.75				1.4485	1.5217
2.00			1.4153	1.6026	1.6552
2.50		1.5066	1.7206	1.8386	1.8708
3.00	1.5715	1.7774	1.9336	2.0171	2.0395
4.00	2.0054	2.1399	2.2375	2.2882	2.3016
5.00	2.3020	2.3998	2.4695	2.5052	2.5146
7.50	2.8301	2.8871	2.9269	2.9471	2.9524
10.00	3.2128	3.2521	3.2793	3.2930	3.2966
15.00	3.7128	3.7353	3.7508	3.7586	3.7607
20.00	3.9938	4.0082	4.0181	4.0231	4.0244
40.00	4.3709	3.3752	4.3781	4.3796	4.3800
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d + t) = 0.400 \qquad b/(a + t) = 0$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					1.9458
1.25					2.3534
1.50				2.5085	2.7001
1.75				2.8631	2.9882
2.00			2.8307	3.1356	3.2244
2.50		3.0133	3.3337	3.5225	3.5749
3.00	3.1430	3.4163	3.6475	3.7759	3.8108
4.00	3.6924	3.8660	3.9990	4.0698	4.0887
5.00	3.9774	4 0930	4.1788	4.2237	4.2356
7.50	4.2778	4.3309	4.3693	4.3891	4.3943
10.00	4.3876	4.4177	4.4394	4.4505	4.4534
15 00	4.4675	4.4810	4.4906	4.4956	4.4969
20.00	4.4958	4.5034	4.5088	4.5116	4.5123
40.00	4.5232	4.5251	4.5264	4.5271	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE VI—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.500$ $b/a = 0$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					0.9727
1.25					1.1766
1.50				1.2281	1.3500
1.75				1.4155	1.4941
2.00			1.3539	1.5567	1.6122
2.50		1.4025	1.6333	1.7549	1.7874
3.00	1.4201	1.6434	1.8019	1.8837	1.9054
4.00	1.7716	1.8994	1.9878	2.0326	2.0444
5.00	1.9429	2.0256	2.0821	2.1104	2.1178
7.50	2.1192	2.1564	2.1814	2.1939	2.1972
10.00	2.1828	2.2038	2.2179	2.2249	2.2267
15.00	2.2289	2.2382	2.2445	2.2476	2.2484
20.00	2.2452	2.2504	2.2540	2.2557	2.2562
40.00	2.2609	2.2622	2.2631	2 2635	2.2637
∞	2.2662	2.2662	2.2662	2.2662	2.2662

Double Sided Sheet

$c/(d+t) = 0.500$ $b/(a+t) = 0$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					1.9454
1.25					2.3532
1.50				2.4562	2.7000
1.75				2.8311	2.9881
2.00			2.7078	3.1134	3.2244
2.50		2.8050	3.2666	3.5098	3.5749
3.00	2.8403	3.2868	3.6038	3.7674	3.8108
4.00	3.5432	3.7987	3.9757	4.0652	4.0887
5.00	3.8859	4.0511	4.1641	4.2208	4.2356
7.50	4.2385	4.3127	4.3629	4.3878	4.3943
10.00	4.3657	4.4076	4.4358	4.4498	4.4534
15.00	4.4578	4.4765	4.4890	4.4952	4.4968
20 00	4.4903	4.5009	4.5079	4.5114	4.5123
40.00	4.5218	4.5245	4.5262	4.5271	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Table VII—Four Point Probe Conversion Factors for Rectangles

Insulated Edge Sheet

$c/d = 0.$ $b/a = 0.100$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					0.9993
1.25					1.2467
1.50					1.4893
1.75					1.7239
2.00				1.9341	1.9475
2.50			2.2859	2.3487	2.3541
3.00			2.6639	2.6976	2.7005
4.00	3.0068	3.1482	3.2082	3.2233	3.2246
5.00	3.4487	3.5305	3.5654	3.5742	3.5750
7.50	3.9840	4.0176	4.0319	4.0355	4.0358
10.00	4.2072	4.2256	4.2335	4.2355	4.2356
15.00	4.3818	4.3899	4.3934	4.3942	4.3943
20.00	4.4464	4.4510	4.4529	4.4534	4.4534
40.00	4.5106	4.5117	4.5122	4.5123	4.5123
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.$ $b/(a+t) = 0.100$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					1.9609
1.25					2.3594
1.50					2.7034
1.75					2.9903
2.00				3.4342	3.2259
2.50			4.0306	3.6978	3.5757
3.00			4.1124	3.8925	3.8113
4.00	4.7200	4.4504	4.2513	4.1330	4.0890
5.00	4.6254	4.4616	4.3378	4.2635	4.2358
7.50	4.5621	4.4926	4.4390	4.4065	4.3944
10.00	4.5468	4.5083	4.4784	4.4603	4.4535
15.00	4.5381	4.5211	4.5079	4.4999	4.4969
20.00	4.5354	4.5259	4.5185	4.5140	4.5123
40.00	4.5331	4.5307	4.5289	4.5277	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE VIII—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.100$ $b/a = 0.100$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					0.9964
1.25					1.2405
1.50					1.4778
1.75					1.7061
2.00				1.8996	1.9232
2.50			2.2323	2.3047	2.3181
3.00			2.6030	2.6473	2.6568
4.00	2.9402	3.0792	3.1459	3.1701	3.1760
5.00	3.3844	3.4678	3.5095	3.5256	3.5298
7.50	3.9400	3.9762	3.9952	4.0030	4.0051
10.00	4.1780	4.1985	4.2094	4.2140	4.2153
15.00	4.3672	4.3764	4.3814	4.3835	4.3741
20.00	4.4378	4.4430	4.4458	4.4471	4.4474
40.00	4.5083	4.5096	4.5103	4.5106	4.5107
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.100$ $b/(a+t) = 0.100$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					1.9584
1.25					2.3584
1.50					2.7029
1.75					2.9899
2.00				3.4003	3.2256
2.50			3.9670	3.6766	3.5756
3.00			4.0671	3.8780	3.8112
4.00	4.6529	4.4024	4.2253	4.1250	4.0890
5.00	4.5813	4.4302	4.3211	4.2584	4.2358
7.50	4.5420	4.4784	4.4315	4.4043	4.3944
10.00	4.5354	4.5003	4.4742	4.4590	4.4535
15.00	4.5330	4.5175	4.5060	4.4993	4.4969
20.00	4.5325	4.5239	4.5175	4.5137	4.5123
40.00	4.5324	4.5302	4.5286	4.5277	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE IX—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.200$ $b/a = 0.100$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					0.9885
1.25					1.2235
1.50					1.4461
1.75					1.6562
2.00				1.8043	1.8537
2.50			2.0797	2.1788	2.2117
3.00			2.4261	2.4976	2.5226
4.00	2.7315	2.8679	2.9541	3.0010	3.0178
5.00	3.1765	3.2675	3.3288	3.3630	3.3753
7.50	3.7885	3.8348	3.8674	3.8859	3.8926
10.00	4.0744	4.1026	4.1226	4.1340	4.1381
15.00	4.3138	4.3271	4.3367	4.3422	4.3441
20.00	4.4061	4.4138	4.4193	4.4225	4.4236
40.00	4.4999	4.5019	4.5033	4.5042	4.5045
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.200$ $b/(a+t) = 0.100$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					1.9518
1.25					2.3558
1.50					2.7014
1.75					2.9890
2.00				3.3059	3.2250
2.50			3.7832	3.6188	3.5752
3.00			3.9378	3.8389	3.8110
4.00	4.4425	4.2593	4.1522	4.1035	4.0888
5.00	4.4431	4.3373	4.2743	4.2448	4.2357
7.50	4.4790	4.4366	4.4107	4.3983	4.3943
10.00	4.4997	4.4767	4.4625	4.4556	4.4534
15.00	4.5170	4.5070	4.5008	4.4978	4.4969
20.00	4.5236	4.5180	4.5145	4.5129	4.5123
40.00	4.5301	4.5287	4.5279	4.5275	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE X—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.300$ $b/a = 0.100$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					0.9786
1.25					1.2012
1.50					1.4031
1.75					1.5863
2.00				1.6736	1.7530
2.50			1.8593	1.9946	2.0467
3.00			2.1594	2.2613	2.3000
4.00	2.3720	2.5147	2.6260	2.6945	2.7201
5.00	2.7913	2.8983	2.9825	3.0337	3.0527
7.50	3.4592	3.5226	3.5720	3.6016	3.6124
10.00	3.8270	3.8687	3.9008	3.9200	3.9270
15.00	4.1744	4.1957	4.2120	4.2217	4.2252
20.00	4.3203	4.3329	4.3426	4.3484	4.3505
40.00	4.4764	4.4798	4.4824	4.4839	4.4844
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.300$ $b/(a+t) = 0.100$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					1.9435
1.25					2.3525
1.50					2.6996
1.75					2.9878
2.00				3.1760	3.2242
2.50			3.5083	3.5422	3.5747
3.00			3.7510	3.7879	3.8107
4.00	4.0782	4.0364	4.0499	4.0759	4.0887
5.00	4.2066	4.1950	4.2096	4.2274	4.2356
7.50	4.3730	4.3736	4.3823	4.3907	4.3943
10.00	4.4400	4.4413	4.4466	4.4514	4.4534
15.00	4.4904	4.4913	4.4938	4.4959	4.4968
20.00	4.5086	4.5092	4.5106	4.5118	4.5123
40.00	4.5264	4.5265	4.5269	4.5272	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XI—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.400$ $\quad b/a = 0.100$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					0.9703
1.25					1.1820
1.50					1.3646
1.75					1.5209
2.00				1.5537	1.6547
2.50			1.6423	1.8091	1.8705
3.00			1.8792	1.9966	2.0393
4.00	1.9280	2.0841	2.2048	2.2759	2.3015
5.00	2.2469	2.3605	2.4465	2.4966	2.5145
7.50	2.7986	2.8648	2.9140	2.9423	2.9523
10.00	3.1911	3.2368	3.2705	3.2898	3.2966
15.00	3.7005	3.7267	3.7458	3.7568	3.7606
20.00	3.9858	4.0027	4.0150	4.0219	4.0244
40.00	4.3686	4.3736	4.3772	4.3792	4.3800
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.400$ $\quad b/(a+t) = 0.100$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					1.9367
1.25					2.3498
1.50					2.6982
1.75					2.9869
2.00				3.0566	3.2235
2.50			3.2235	3.4755	3.5744
3.00			3.5696	3.7444	3.8104
4.00	3.6212	3.7988	3.9552	4.0526	4.0885
5.00	3.9241	4.0485	4.1508	4.2129	4.2355
7.50	4.2518	4.3106	4.3569	4.3843	4.3943
10.00	4.3726	4.4063	4.4324	4.4478	4.4534
15.00	4.4607	4.4759	4.4875	4.4944	4.4968
20.00	4.4919	4.5005	4.5071	4.5109	4.5123
40.00	4.5222	4.5244	4.5260	4.5270	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XII—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.500$ $b/a = 0.100$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					0.9670
1.25					1.1744
1.50					1.3488
1.75					1.4933
2.00				1.5034	1.6116
2.50			1.5453	1.7243	1.7871
3.00			1.7453	1.8636	1.9052
4.00	1.6839	1.8439	1.9578	2.0218	2.0442
5.00	1.8899	1.9912	2.0633	2.1036	2.1177
7.50	2.0966	2.1415	2.1733	2.1909	2.1971
10.00	2.1702	2.1955	2.2133	2.2232	2.2267
15.00	2.2233	2.2346	2.2425	2.2469	2.2484
20.00	2.2420	2.2484	2.2528	2.2553	2.2561
40.00	2.2601	2.2617	2.2628	2.2634	2.2637
∞	2.2662	2.2662	2.2662	2.2662	2.2662

Double Sided Sheet

$c/(d+t) = 0.500$ $b/(a+t) = 0.100$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					1.9341
1.25					2.3487
1.50					2.6976
1.75					2.9866
2.00				3.0068	3.2233
2.50			3.0906	3.4487	3.5742
3.00			3.4906	3.7271	3.8103
4.00	3.3679	3.6877	3.9157	4.0435	4.0885
5.00	3.7797	3.9824	4.1266	4.2072	4.2355
7.50	4.1931	4.2830	4.3465	4.3818	4.3942
10.00	4.3405	3.3910	4.4266	4.4464	4.4534
15.00	4.4467	4.4692	4.4850	4.4938	4.4968
20.00	4.4841	4.4967	4.5056	4.5106	4.5123
40.00	4.5203	4.5234	4.5257	4.5269	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XIII—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.$ $b/a = 0.200$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					1.2451
1.25					1.4889
1.50					1.7237
1.75					1.9475
2.00					
2.50				2.2874	2.3541
3.00				2.6647	2.7005
4.00			3.1175	3.2086	3.2246
5.00	3.1345	3.3772	3.5128	3.5656	3.5750
7.50	3.8589	3.9553	4.0103	4.0320	4.0358
10.00	4.1388	4.1915	4.2216	4.2335	4.2356
15.00	4.3520	4.3750	4.3882	4.3934	4.3943
20.00	4.4297	4.4426	4.4500	4.4529	4.4534
40.00	4.5064	4.5096	4.5114	4.5122	4.5123
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d + t) = 0.$ $b/(a + t) = 0.200$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					2.4187
1.25					2.7359
1.50					3.0111
1.75					3.2405
2.00					
2.50				3.9559	3.5843
3.00				4.0662	3.8170
4.00			4.4278	4.2278	4.0921
5.00	4.7608	4.5990	4.4499	4.3234	4.2377
7.50	4.6225	4.5536	4.4885	4.4329	4.3952
10.00	4.5809	4.5426	4.5062	4.4750	4.4539
15.00	4.5532	4.5364	4.5202	4.5064	4.4971
20.00	4.5440	4.5345	4.5255	4.5177	4.5124
40.00	4.5352	4.5329	4.5306	4.5287	4.5274
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XIV—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.100$ $b/a = 0.200$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					1.2362
1.50					1.4756
1.75					1.7047
2.00					1.9222
2.50				2.2374	2.3174
3.00				2.6069	2.6562
4.00			3.0539	3.1484	3.1757
5.00	3.0884	3.3212	3.4534	3.5113	3.5295
7.50	3.8212	3.9148	3.9704	3.9962	4.0050
10.00	4.1126	4.1642	4.1953	4.2100	4.2152
15.00	4.3385	4.3612	4.3750	4.3816	4.3840
20.00	4.4217	4.4345	4.4422	4.4460	4.4474
40.00	4.5043	4.5075	4.5094	4.5104	4.5107
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d + t) = 0.100$ $b/(a + t) = 0.200$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					2.4074
1.50					2.7294
1.75					3.0068
2.00					3.2375
2.50				3.9067	3.5825
3.00				4.0296	3.8158
4.00			4.3898	4.2062	4.0915
5.00	4.7307	4.5683	4.4239	4.3093	4.2373
7.50	4.6071	4.5384	4.4762	4.4265	4.3951
10.00	4.5718	4.5337	4.4992	4.4714	4.4538
15.00	4.5491	4.5323	4.5171	4.5048	4.4970
20.00	4.5416	4.5322	4.5237	4.5168	4.5124
40.00	4.5346	4.5323	4.5302	4.5284	4.5274
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XV—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.200$ $\quad b/a = 0.200$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					1.2121
1.25					1.4396
1.50					1.6517
1.75					1.8503
2.00					
2.50				2.0931	2.2094
3.00				2.4367	2.5209
4.00			2.8538	2.9614	3.0166
5.00	2.9283	3.1329	3.2598	3.3342	3.3745
7.50	3.6832	3.7711	3.8316	3.8704	3.8921
10.00	4.0140	4.0647	4.1007	4.1244	4.1378
15.00	4.2861	4.3094	4.3263	4.3376	4.3440
20.00	4.3903	4.4036	4.4133	4.4198	4.4236
40.00	4.4959	4.4993	4.5018	4.5035	4.5044
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.200$ $\quad b/(a+t) = 0.200$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					2.3768
1.25					2.7121
1.50					2.9957
1.75					3.2296
2.00					
2.50				3.7584	3.5779
3.00				3.9223	3.8128
4.00			4.2683	4.1442	4.0898
5.00	4.6181	4.4612	4.3420	4.2693	4.2363
7.50	4.5493	4.4861	4.4382	4.4086	4.3946
10.00	4.5377	4.5034	4.4774	4.4613	4.4536
15.00	4.5334	4.5186	4.5073	4.5003	4.4969
20.00	4.5327	4.5244	4.5182	4.5142	4.5123
40.00	4.5324	4.5303	4.5288	4.5278	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XVI—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.300$ $b/a = 0.200$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					1.1809
1.50					1.3916
1.75					1.5786
2.00					1.7473
2.50				1.8795	2.0430
3.00				2.1753	2.2973
4.00			2.5060	2.6369	2.7183
5.00	2.5907	2.7616	2.8926	2.9907	3.0514
7.50	3.3551	3.4443	3.5196	3.5768	3.6116
10.00	3.7602	3.8176	3.8668	3.9040	3.9265
15.00	4.1405	4.1697	4.1947	4.2136	4.2250
20.00	4.3001	4.3175	4.3324	4.3436	4.3503
40.00	4.4711	4.4757	4.4796	4.4826	4.4844
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.300$ $b/(a+t) = 0.200$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					2.3364
1.50					2.6901
1.75					2.9816
2.00					3.2197
2.50				3.5218	3.5721
3.00				3.7603	3.8089
4.00			4.0533	4.0551	4.0877
5.00	4.3434	4.2388	4.2024	4.2130	4.2350
7.50	4.4122	4.3821	4.3757	4.3838	4.3940
10.00	4.4580	4.4441	4.4422	4.4474	4.4533
15.00	4.4972	4.4920	4.4917	4.4942	4.4968
20.00	4.5122	4.5094	4.5094	4.5108	4.5123
40.00	4.5272	4.5266	4.5266	4.5270	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XVII—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.400$ $b/a = 0.200$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					1.1542
1.25					1.3494
1.50					1.5111
1.75					1.6477
2.00					
2.50				1.6645	1.8662
3.00				1.8960	2.0363
4.00			2.0700	2.2156	2.2997
5.00	2.0458	2.2102	2.3514	2.4543	2.5133
7.50	2.6821	2.7787	2.8602	2.9185	2.9516
10.00	3.1105	3.1777	3.2338	3.2736	3.2961
15.00	3.6540	3.6929	3.7250	3.7476	3.7604
20.00	3.9559	3.9810	4.0016	4.0161	4.0242
40.00	4.3597	4.3671	4.3732	4.3775	4.3799
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.400$ $b/(a+t) = 0.200$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					2.3014
1.25					2.6718
1.50					2.9701
1.75					3.2117
2.00					
2.50				3.2608	3.5674
3.00				3.5961	3.8058
4.00			3.7889	3.9704	4.0860
5.00	3.7970	3.9021	4.0414	4.1606	4.2339
7.50	4.1715	4.2390	4.3073	4.3613	4.3936
10.00	4.3241	4.3650	4.4044	4.4349	4.4530
15.00	4.4382	4.4572	4.4750	4.4886	4.4967
20.00	4.4791	4.4900	4.5000	4.5077	4.5122
40.00	4.5190	4.5217	4.5242	4.5262	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XVIII—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.500$ $b/a = 0.200$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					1.1437
1.50					1.3323
1.75					1.4828
2.00					1.6043
2.50				1.5672	1.7828
3.00				1.7614	1.9023
4.00			1.8259	1.9673	2.0427
5.00	1.6678	1.8474	1.9815	2.0694	2.1168
7.50	2.0041	2.0801	2.1378	2.1760	2.1967
10.00	2.1191	2.1613	2.1935	2.2149	2.2265
15.00	2.2009	2.2195	2.2337	2.2432	2.2483
20.00	2.2294	2.2399	2.2479	2.2532	2.2561
40.00	2.2570	2.2596	2.2616	2.2629	2.2636
∞	2.2662	2.2662	2.2662	2.2662	2.2662

Double Sided Sheet

$c/(d+t) = 0.500$ $b/(a+t) = 0.200$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					2.2874
1.50					2.6647
1.75					2.9656
2.00					3.2086
2.50				3.1345	3.5656
3.00				3.5229	3.8046
4.00			3.6519	3.9345	4.0854
5.00	3.3357	3.6948	3.9629	4.1388	4.2335
7.50	4.0083	4.1601	4.2756	4.3520	4.3934
10.00	4.2382	4.3227	4.3870	4.4297	4.4529
15.00	4.4017	4.4390	4.4675	4.4864	4.4966
20.00	4.4589	4.4798	4.4958	4.5064	4.5122
40.00	4.5140	4.5192	4.5232	4.5259	4.5273
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XIX—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.$ $b/a = 0.300$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					1.9342
2.50					2.3488
3.00					2.6976
4.00				3.0207	3.2233
5.00			3.1364	3.4573	3.5742
7.50	3.3137	3.6363	3.8599	3.9877	4.0355
10.00	3.8480	4.0185	4.1394	4.2092	4.2355
15.00	4.2264	4.2998	4.3523	4.3828	4.3942
20.00	4.3597	4.4006	4.4299	4.4470	4.4534
40.00	4.4890	4.4992	4.5065	4.5107	4.5123
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.$ $b/(a+t) = 0.300$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					3.4160
2.50					3.6878
3.00					3.8860
4.00				4.5183	4.1295
5.00			4.6857	4.5081	4.2613
7.50	4.7125	4.6570	4.5933	4.5144	4.4056
10.00	4.6317	4.6009	4.5651	4.5208	4.4597
15.00	4.5759	4.5623	4.5464	4.5267	4.4996
20.00	4.5567	4.5491	4.5402	4.5291	4.5139
40.00	4.5384	4.5365	4.5343	4.5315	4.5277
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XX—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.100$ $b/a = 0.300$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					1.9007
2.50					2.3055
3.00					2.6478
4.00				2.9618	3.1705
5.00			3.0931	3.3997	3.5259
7.50	3.2943	3.6086	3.8240	3.9476	4.0031
10.00	3.8317	3.9977	4.1143	4.1825	4.2141
15.00	4.2170	4.2885	4.3393	4.3693	4.3835
20.00	4.3539	4.3938	4.4222	4.4390	4.4471
40.00	4.4875	4.4973	4.5044	4.5086	4.5106
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.100$ $b/(a+t) = 0.300$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					3.3858
2.50					3.6685
3.00					3.8728
4.00				4.4810	4.1222
5.00			4.6662	4.4813	4.2566
7.50	4.7137	4.6520	4.5820	4.5013	4.4035
10.00	4.6317	4.5974	4.5582	4.5131	4.4586
15.00	4.5757	4.5605	4.5432	4.5233	4.4991
20.00	4.5566	4.5481	4.5383	4.5271	4.5136
40.00	4.5384	4.5363	4.5338	4.5310	4.5276
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Table XXI—Four Point Probe Conversion Factors for Rectangles

Insulated Edge Sheet

$c/d = 0.200$ $b/a = 0.300$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					1.8077
2.50					2.1812
3.00					2.4995
4.00				2.7720	3.0022
5.00			2.9396	3.2080	3.3639
7.50	3.2150	3.4999	3.6905	3.8065	3.8864
10.00	3.7634	3.9138	4.0187	4.0857	4.1343
15.00	4.1766	4.2418	4.2884	4.3192	4.3423
20.00	4.3289	4.3654	4.3917	4.4093	4.4226
40.00	4.4806	4.4897	4.4963	4.5007	4.5042
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d + t) = 0.200$ $b/(a + t) = 0.300$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					3.3004
2.50					3.6157
3.00					3.8369
4.00				4.3519	4.1024
5.00			4.5820	4.3905	4.2441
7.50	4.7042	4.6211	4.5352	4.4576	4.3980
10.00	4.6230	4.5771	4.5301	4.4879	4.4555
15.00	4.5707	4.5506	4.5301	4.5119	4.4978
20.00	4.5535	4.5423	4.5309	4.5207	4.5128
40.00	4.5376	4.5348	4.5319	4.5294	4.5275
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XXII—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.300$ $b/a = 0.300$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					1.6792
2.50					1.9984
3.00					2.2641
4.00				2.4283	2.6964
5.00			2.6075	2.8365	3.0351
7.50	2.9833	3.2084	3.3665	3.4872	3.6024
10.00	3.5491	3.6726	3.7679	3.8456	3.9205
15.00	4.0408	4.0979	4.1446	4.1840	4.2220
20.00	4.2420	4.2751	4.3026	4.3260	4.3485
40.00	4.4560	4.4645	4.4718	4.4779	4.4839
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.300$ $b/(a+t) = 0.300$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					3.1805
2.50					3.5449
3.00					3.7897
4.00				4.0884	4.0769
5.00			4.3423	4.2144	4.2280
7.50	4.6078	4.4946	4.4119	4.3770	4.3909
10.00	4.5564	4.4985	4.4579	4.4423	4.4515
15.00	4.5371	4.5133	4.4972	4.4915	4.4960
20.00	4.5339	4.5209	4.5122	4.5092	4.5118
40.00	4.5325	4.5293	4.5272	4.5265	4.5272
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XXIII—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.400$ $b/a = 0.300$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					1.5604
2.50					1.8134
3.00					1.9996
4.00				1.9827	2.2778
5.00			2.0607	2.2895	2.4979
7.50	2.3738	2.5410	2.6924	2.8250	2.9430
10.00	2.8994	3.0123	3.1180	3.2096	3.2903
15.00	3.5308	3.5969	3.6585	3.7112	3.7570
20.00	3.8758	3.9189	3.9588	3.9928	4.0221
40.00	4.3356	4.3486	4.3606	4.3706	4.3793
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.400$ $b/(a+t) = 0.300$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					3.0681
2.50					3.4825
3.00					3.7491
4.00				3.6999	4.0553
5.00			3.8172	3.9776	4.2145
7.50	4.1431	4.1234	4.1814	4.2771	4.3851
10.00	4.2733	4.2859	4.3298	4.3871	4.4482
15.00	4.4063	4.4183	4.4409	4.4673	4.4946
20.00	4.4595	4.4674	4.4806	4.4956	4.5110
40.00	4.5137	4.5159	4.5194	4.5231	4.5270
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XXIV—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.500$ $b/a = 0.300$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					1.5103
2.50					1.7287
3.00					1.8665
4.00				1.7316	2.0234
5.00			1.6789	1.9240	2.1046
7.50	1.6878	1.8696	2.0106	2.1132	2.1914
10.00	1.9485	2.0459	2.1230	2.1798	2.2235
15.00	2.1268	2.1689	2.2027	2.2277	2.2470
20.00	2.1880	2.2116	2.2305	1.2445	2.2553
40.00	2.2467	2.2526	2.2573	2.2607	2.2635
∞	2.2662	2.2662	2.2662	2.2662	2.2662

Double Sided Sheet

$c/(d+t) = 0.500$ $b/(a+t) = 0.300$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					3.0207
2.50					3.4573
3.00					3.7330
4.00				3.4632	4.0468
5.00			3.3578	3.8480	4.2092
7.50	3.3755	3.7392	4.0211	4.2264	4.3828
10.00	3.8970	4.0917	4.2460	4.3597	4.4469
15.00	4.2535	4.3379	4.4054	4.4554	4.4940
20.00	4.3761	4.4232	4.4610	4.4890	4.5107
40.00	4.4934	4.5051	4.5145	4.5214	4.5269
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XXV—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.$ $b/a = 0.400$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					
2.50					
3.00					
4.00					3.0207
5.00					3.4573
7.50				3.3139	3.9877
10.00			3.3588	3.8481	4.2092
15.00	3.3790	3.7411	4.0217	4.2264	4.3828
20.00	3.8996	4.0929	4.2463	4.3597	4.4469
40.00	4.3769	4.4235	4.4611	4.4890	4.5107
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.$ $b/(a+t) = 0.400$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					
2.50					
3.00					
4.00					4.5179
5.00					4.5079
7.50				4.6912	4.5143
10.00			4.6490	4.6204	4.5207
15.00	4.5981	4.5915	4.5838	4.5711	4.5267
20.00	4.5692	4.5655	4.5612	4.5540	4.5291
40.00	4.5415	4.5406	4.5396	4.5377	4.5315
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XXVI—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.100$ $b/a = 0.400$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					
2.50					
3.00					
4.00					2.9619
5.00					3.3997
7.50				3.2950	3.9477
10.00			3.3505	3.8323	4.1826
15.00	3.3769	3.7375	4.0159	4.2173	4.3693
20.00	3.8979	4.0904	4.2426	4.3541	4.4390
40.00	4.3763	4.4228	4.4600	4.4875	4.5086
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.100$ $b/(a+t) = 0.400$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					
2.50					
3.00					
4.00					4.4807
5.00					4.4812
7.50				4.6949	4.5012
10.00			4.6576	4.6218	4.5131
15.00	4.6050	4.5972	4.5874	4.5714	4.5232
20.00	4.5731	4.5687	4.5632	4.5542	4.5271
40.00	4.5425	4.5414	4.5401	4.5378	4.5310
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XXVII—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.200$ $b/a = 0.400$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					
2.50					
3.00					
4.00					2.7720
5.00					3.2081
7.50				3.2172	3.8065
10.00			3.3128	3.7650	4.0857
15.00	3.3662	3.7202	3.9890	4.1775	4.3192
20.00	3.8895	4.0783	4.2250	4.3293	4.4093
40.00	4.3736	4.4191	4.4550	4.4807	4.5008
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d + t) = 0.200$ $b/(a + t) = 0.400$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					
2.50					
3.00					
4.00					4.3517
5.00					4.3904
7.50				4.6922	4.4575
10.00			4.6800	4.6167	4.4879
15.00	4.6288	4.6151	4.5962	4.5680	4.5119
20.00	4.5863	4.5786	4.5679	4.5520	4.5207
40.00	4.5458	4.5438	4.5412	4.5371	4.5294
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XXVIII—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.300$ $b/a = 0.400$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					
2.50					
3.00					
4.00					2.4284
5.00					2.8366
7.50				2.9868	3.4873
10.00			3.1754	3.5519	3.8456
15.00	3.3173	3.6457	3.8834	4.0423	4.1840
20.00	3.8497	4.0240	4.1538	4.2429	4.3260
40.00	4.3599	4.4019	4.4338	4.4561	4.4780
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.300$ $b/(a+t) = 0.400$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					
2.50					
3.00					
4.00					4.0885
5.00					4.2144
7.50				4.6047	4.3770
10.00			4.6784	4.5547	4.4423
15.00	4.6732	4.6360	4.5890	4.5364	4.4915
20.00	4.6099	4.5888	4.5625	4.5334	4.5092
40.00	4.5513	4.5460	4.5395	4.5323	4.5265
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XXIX—FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.400$ $b/a = 0.400$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					
2.50					
3.00					
4.00					1.9828
5.00					2.2896
7.50				2.3770	2.8250
10.00			2.6425	2.9019	3.2097
15.00	2.9967	3.2263	3.3934	3.5325	3.7112
20.00	3.5598	3.6860	3.7872	3.8768	3.9928
40.00	4.2459	4.2797	4.3089	4.3358	4.3706
∞	4.5324	4.5324	4.5324	4.5324	4.5324

Double Sided Sheet

$c/(d+t) = 0.400$ $b/(a+t) = 0.400$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					
2.50					
3.00					
4.00					3.7000
5.00					3.9777
7.50				4.1463	4.2771
10.00			4.3750	4.2751	4.3871
15.00	4.6073	4.5018	4.4276	4.4071	4.4673
20.00	4.5562	4.5026	4.4671	4.4598	4.4956
40.00	4.5338	4.5219	4.5146	4.5137	4.5232
∞	4.5324	4.5324	4.5324	4.5324	4.5324

TABLE XXX —FOUR POINT PROBE CONVERSION FACTORS FOR RECTANGLES

Insulated Edge Sheet

$c/d = 0.500$ $b/a = 0.400$

d/S	$a/d = 1.000$	$a/d = 1.200$	$a/d = 1.500$	$a/d = 2.000$	$a/d = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					
2.50					
3.00					
4.00					1.7317
5.00					1.9240
7.50				1.6895	2.1132
10.00			1.6914	1.9498	2.1799
15.00	1.6921	1.8751	2.0188	2.1274	2.2277
20.00	1.9518	2.0496	2.1282	2.1884	2.2445
40.00	2.1891	2.2127	2.2319	2.2467	2.2608
∞	2.2662	2.2662	2.2662	2.2662	2.2662

Double Sided Sheet

$c/(d+t) = 0.500$ $b/(a+t) = 0.400$

$\frac{d+t}{S}$	$\frac{a+t}{d+t} = 1.000$	$\frac{a+t}{d+t} = 1.200$	$\frac{a+t}{d+t} = 1.500$	$\frac{a+t}{d+t} = 2.000$	$\frac{a+t}{d+t} = 4.000$
1.00					
1.25					
1.50					
1.75					
2.00					
2.50					
3.00					
4.00					3.4634
5.00					3.8481
7.50				3.3790	4.2264
10.00			3.3829	3.8996	4.3597
15.00	3.3842	3.7502	4.0376	4.2548	4.4554
20.00	3.9035	4.0992	4.2564	4.3767	4.4890
40.00	4.3781	4.4254	4.4639	4.4935	4.5215
∞	4.5324	4.5324	4.5324	4.5324	4.5324

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